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MAN.

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FACULTIES OF THE MIND, AND SPEECH. All philosophers refer with one accord to the enjoyment of reason as the chief and most important prerogative of the human species. If we inquire, however, more particularly into the meaning of this word, we shall be surprised to find what various senses different individuals affix to the same expression. According to some, reason is a peculiar faculty of the mind, belonging exclusively to man; others consider it as a more enlarged and complete developement of a power which exists, in a less degree, in other animals; some describe it as a combination of all the higher faculties of the mind; while others assert that it is only a peculiar direction of them.

The subject may, perhaps, be more shortly and safely despatched by considering it *à posteriori*. In order to acquire a clear and satisfactory notion of the mental nature of man and animals, it would be necessary for us to have as complete a knowledge of their internal movements as we have of our own. But, as it is impossible to know what passes within them, or how to rank and estimate their sensations, in relation to those of man, we can only judge by comparing the effects which result from the natural operations of both.

Let us, therefore, consider these effects; and, while we acknowledge all the particular resemblances, we shall only examine some of the most general distinctions. The most

stupid man is able to manage the most alert and sagacious animal; he governs it and makes it subservient to his purposes. This he effects, not so much by bodily strength or address, as by the superiority of his intellectual nature. He compels the animal to obey him, by his power of projecting and acting in a systematic manner. The strongest and most sagacious animals have not the capacity of commanding the inferior tribes, or of reducing them to a state of servitude. The stronger, indeed, devour the weaker; but this action implies an urgent necessity only, and a voracious appetite—qualities very different from that which produces a train of actions all directed to one common design. If animals be endowed with this faculty, why do not some of these assume the reins of government over others, and force them to furnish their food, to watch for them, and to relieve the sick or wounded? But among animals there is no mark of subordination, nor the least trace of any of them being able to recognize or feel a superiority in his nature above that of other species. We should therefore conclude that all animals are in this respect of the same nature, and that the nature of man is not only far superior, but likewise of a very different kind from that of the brute.

Thrown on the surface of the globe, weak, naked and defenceless, man appeared created for inevitable destruction. Evils assailed him on every side; the remedies remained hidden. But he had received from his Creator the gift of inventive genius, which enabled him to discover them. His exertions were roused by the various wants of food, clothing and dwelling—by the infinite variety of climate, soil and other circumstances:—

'Pater ipse colendi
Haud facilem esse viam voluit; primusque per artem
Movit agros; curis acuens mortalia corda.'*

This prerogative of invention seemed so important in the earlier periods of society, that it has been honored with divine worship, as the Thoth of the Egyptians, the Hermes of the Greeks.

The first savages collected in the forests a few nourishing fruits, a few salutary roots, and thus supplied their most immediate wants. The first shepherds observed that the stars move in a regular course, and made use of them to guide their

* The father himself of tillage did not wish the way to be easy: he was the first to turn the soil by art, inciting the human heart by anxiety.

journeys across the plains of the desert. Such was the origin of the mathematical and physical sciences.

Once convinced that it could combat nature by the means which she herself afforded, genius reposed no more; it watched her without relaxation; it incessantly made new conquests over her, all of them distinguished by some improvement in the situation of our race.

From that time a succession of conducting minds, faithful depositories of the attainments already made, constantly occupied in connecting them, in vivifying them by means of each other, have conducted us, in less than forty ages, from the first essays of rude observers, to the profound calculations of Newton and La Place, to the learned classifications of Linné and Jussieu. This precious inheritance, perpetually increasing, brought from Chaldea into Egypt, from Egypt into Greece, concealed during ages of disaster and darkness, recovered in more fortunate times, unequally spread among the nations of Europe, has every where been followed by wealth and power. The nations which have reaped it are become the mistresses of the world; such as have neglected it are fallen into weakness and obscurity.

Man has made tools for assisting his labor; and hence Franklin sagaciously defined him a *tool making animal:* he has formed arms and weapons; he has devised various means of procuring fire. The most noble and profitable invention of all others was that of speech, whereby men declare their thoughts one to another for mutual utility and conversation, without which there had been among men neither commonwealth nor society, no more than among lions, bears and wolves. This is a most important characteristic of man, since it is not born with him like the voices of animals, but has been framed and brought into use by himself, as the arbitrary variety of different languages incontestably proves.

Man exhibits by external signs what passes within him; he communicates his sentiments by words; and this sign is universal. The savage and the civilized man have the same powers of utterance; both speak naturally, and are equally understood. It is not owing, as some have imagined, to any defect in their organs, that animals are denied the faculty of speech. The tongue of a monkey is as perfect as that of a man. Camper asserts that the laryngeal pouch renders it impossible for the orang outang to speak. We do not clearly understand how this is ascertained; but allowing its truth, there are other monkeys who have not this pouch, and yet cannot speak.

Several animals may be taught to pronounce words, and even to repeat sentences; which proves clearly that the want of speech is not owing to any defect in their organs; but to make them conceive the ideas which these words express, is beyond the power of art. They articulate and repeat like an echo or machine.

Language implies a train of thinking; and for this reason brute animals are incapable of speech; for, though their external senses are not inferior to our own, and though we should allow some of them to possess a faint dawning of comparison, reflection and judgment, it is certain that they are unable to form that association of ideas in which alone the essence of thought consists.

The possession of speech, therefore, corresponds to the more numerous, diversified and exalted intellectual and moral endowments of man, and is a necessary aid to their exercise and full developement. The ruder faculties and simple feelings of animals do not require such assistance. The natural language of inarticulate sounds, gestures and actions suffices for their purposes. The wonderful discovery of alphabetical writing, and the invention of printing, complete the benefits derived from the noble prerogative of speech.

With the operations of animals,—which always perform the same work in the very same manner, the execution of any individual being neither better nor worse than that of any other, in whom the individual, at the end of some months, is what he will remain through life, and the species, after a thousand years, just what it was in the first year,—contrast the results of human industry and invention, and the fruits of that perfectibility which characterizes both the species and individual. By the intelligence of man the animals have been subdued, tamed and reduced to slavery. By his labors marshes have been drained, rivers confined, their cataracts effaced, forests cleared, and the earth cultivated. By his reflection, time has been computed, space measured, the celestial motions recognized and represented, the heavens and the earth compared. He has not merely executed, but executed with the utmost accuracy, the apparently impracticable tasks assigned him by the poet:—

> 'Go wondrous creature! mount where science guides;
> Weigh air, measure earth, and calculate the tides.'

By human art, which is an emanation of science, mountains have been overcome, and the seas have been traversed; the pilot pursuing his course on the ocean, with as much certainty

as if it had been traced for him by engineers, and finding at each moment the exact point of the globe on which he is, by means of astronomical tables. Thus nations have been united, and a new world has been discovered, opening such a field for the unfettered and uncorrupted energies of our race, that the senses are confused, the mind dazzled, and judgment and calculation almost suspended by the grandeur and brightness of the glorious and interminable prospects. The whole face of the earth at present exhibits the works of human power, which, though subordinate to that of nature, often exceeds, at least, so wonderfully seconds her operations, that, by the aid of man, her whole extent is unfolded, and she has gradually arrived at that point of perfection and magnificence in which we now behold her.

In the point of view which we have just considered, man stands alone: his faculties, and what he has effected by them place him at a wide interval from all animals,—at an interval which no animal hitherto known to us can fill up. The man-like monkey, the almost reasonable elephant, the docile dog, the sagacious beaver, the industrious bee, cannot be compared to him. In none of these instances is there any progress either in the individuals or the species.

In most of the feelings of which other individuals of the species are the subjects, and in all which come under the denomination of moral sentiments, there is a marked difference between man and animals, and a decided inferiority of the latter. The attachment of the mother to the offspring, so long as its wants and feebleness require her aid and defence, seems as strong in the animal as in the human being, and bears equally in both the characters of actions termed instinctive. Its duration is confined in the former case, even in social animals, to the period of helplessness; and the animal instinct is not succeeded, as in man, by that continued intercourse of affection and kind offices, and those endearing relations which constitute the most exalted pleasures of human life.

Of courage the animal kingdom offers many examples; and the moralists have celebrated the attachment of the dog to his master. It may be doubted whether he can find any instance of such feeling between animals themselves, excepting some cases of sexual unions. In general they seem entirely destitute of sympathy with each other, indifferent to each other's sufferings or joys, and unmoved by the worst usage or acutest pangs of their fellows. Indeed, if we except some associated labors in the insect class, principally referring to the continuation of the species, and securing a

supply of food, and some joint operations of the male and female in the higher classes, animals seem entirely incapable of concert or co-operation for common purposes, of combining various exertions for the attainment of a common end. This appears to arise from the limited nature and extent of their knowing and reflecting powers; to which, probably, we must refer their incapability of conceiving moral relations.

Laughing and weeping are natural signs in man of certain mental affections, and probably are also peculiar to him; animals are not susceptible of the emotions or states of mind indicated by these external signs.

That many animals besides man secrete tears is well known; but whether they weep from grief is doubtful; yet respectable witnesses have represented that they do so. Steller states this of the bear seal (*Phoca ursina,*) Pallas of the camel, and Humboldt of a small American monkey.

Whether any animals express mirth or satisfaction by laughter is more doubtful, to say nothing of the other causes of smiling or laughter in our species. The fact has been asserted, for instance, by Le Cat, who says he saw the chimpanzé both laugh and weep. The orang outang is never known to laugh, but it has been known to weep.

The differences between man and animals, in propensities, feelings and intellectual faculties, are supposed to be the result of the same cause as that which we assign for the variations in other functions, viz. difference of organization; and that the superiority of man, in rational endowments, is not greater than the more exquisite, complicated and perfectly developed structure of his brain, and particularly of his ample cerebral hemispheres, to which the rest of the animal kingdom offers no parallel nor even any near approximation, is sufficient to account for. That the senses of man and of other animals will not explain all their varied and wonderful mental phenomena; and that the superiority of man can by no means be deduced from any pre-eminence in this part of his construction, are truths too obvious to require further notice.

Some modern inquirers have gone beyond this general statement, and have ventured to particularize, in the brains of animals and of man, the organ or residence of each propensity, feeling and intellectual power. We cannot pronounce on the accuracy and completeness of the mental and cerebral survey executed by Messrs. Gall and Spurzheim, nor pretend to judge of the exactness and fidelity with which the numerous positions are marked down in their very complete and

well filled map of the brain. They appeal to observation for the confirmation or refutation of their statements; but our observations are not numerous or varied enough for these purposes. No one can refuse to them the merit of patient inquiry, careful observation and unprejudiced reflection. They have performed the useful service of rescuing us from the trammels of doctrines and authorities, and directing our attention to nature; her instructions cannot deceive us. Whether the views of Gall and Spurzheim may be verified or not, our labors in this direction must be productive, and must bring with them collateral advantages. Hence they may be compared to the old man in the fable, who assured his sons, on his death-bed, that a treasure was hidden in his vineyard. They began immediately to dig over the whole ground in search of it; and found, indeed, no treasure; but the loosening of the soil, the destruction of the weeds, the admission of light and air, were so beneficial to the vines, that the quantity and excellence of the ensuing crop were unprecedented.

THE HORSE.

(Continued from page 272.)

The Equine or Horse genus in Great Britain and in this country, is divided and sub-divided into a number of species and varieties of quality and nomenclature. For example, *the racer or running horse, the cock-tail racer, the hunter, hack, hackney road horse or chapman's horse, the cob, the lady's horse or pad, the coach and chariot horse, gig horse, charger and troop horse, the slow draught or cart and dray horse.* A horse below thirteen hands in height, four inches to a hand, is styled a *poney;* above that height and below fourteen hands, a *galloway.*

The *cob*, a denomination perhaps of twenty years standing, refers to a truss, short-legged nag, able to carry weight. The *pack horse* has long since disappeared, perhaps entirely, by virtue of the great modern improvements in roads and carriages. The *cock-tail*, a new term in the slang of the inferior turf, indicates a racer not thorough bred. The *welter horse*, a term of long standing, but of unknown derivation, points to either racer or hunter, is master of the highest weight. The designation *thorough bred* belongs to the racer of pure Ara-

bian or Barb blood. The *nag*, in which the show of blood predominates, is styled *blood-like*, or a *blood horse*.

Beautiful as is the horse, and identified so much with our pleasure and our profit, he has been the object of almost universal regard; and there are few persons who do not pretend to be somewhat competent judges of his form, qualities and worth. From the nobleman, with his numerous and valuable stud, to the meanest helper in the stable, and not excluding even the mechanic who scarcely crosses, or sits behind a horse once in a twelvemonth, there is scarcely a man who would not be offended if he were thought altogether ignorant of horse flesh. There is no subject on which, generally speaking, he is so deficient, and there are few horses on some points of which these pretended and self-sufficient judges would not give a totally opposite opinion.

The conventional form of the horse, as to the great essentials, may be held referable to every variety; for example, the head should be lean, neither long nor short, and set on with somewhat of a curve; the thropple loose and open; the neck not reversed, but rather arched; the loins wide and substantial, more especially should the back be long; the tail not drooping, but nearly on a level with the spine; the hinder quarters well spread, as a support to the loins, and as a security against the approach to each other of the pasterns in progression, whence results cutting them with the hoofs; the hinder legs should descend straight, laterally from the hocks, as a preventive to the defect styled *sickle-houghed* or hammed; at the same time, the curve from the hock should be to the degree, that the feet may be placed sufficiently forward to prop the loins, and that the horse may not be said to leave his legs behind him; the muscles of the thigh and fore arm should be solid and full, though some horses are heavy and overdone by nature in those parts. The horse, of whatever description, should not be *leggy*, and of the extremes, short legs are surely preferable. The canon or leg-bone, below the knee, should not be long, but of good substance, and the pasterns and feet of a size to accord with the size of the horse; the hoof dark, feet and frog tough, heel wide and open: the fore feet should stand perfectly level, the toe pointing forward in a right line, else the horse will knock or 'cut in the speed,' however wide his chest; in plain terms, he will either strike and wound his pasterns, or his legs immediately below the knees, or both; the feet standing even, the horse being equal to his work, will seldom, perhaps never, knock or cut, however near the hoof may approach. A full, clear, azure eye.

Such are the requisites of form, whether for the racer or cart horse. For the *hack*, *hunter*, or *racer*, there are certain other requisites of form and quality; the chief of which to be quoted are the deep, backward-declining, and as it is called, the *counter* or coulter shoulder, well elevated forehand, deep girthing place, with sufficient racing blood to give lightness, action, and fineness of hair and skin. This description applies with perfect aptitude to the hunter, which should have moreover great strength of loin and fillet, and should not be high upon the leg. Nor is any addition necessary for the running horse, but greater general length, which is the usual result of full or thorough blood. As to our coach horses, such is the modern rage for speed, that our mails and stages may well be said to consist, in a considerable degree, of racers and hunters; and our private coaches of hunting-like horses on a large scale.

In regard to the natural and peculiar form of the slow draught horse, he carries his substance in a round, full and horizontal mode; his chest is wide and full; his shoulder rather round and bluff than deep, and its summit, the *apex* or top of the forehand, not high and acute, but wide. Such form seems best adapted to the collar, and to enable the animal to draw, propel or move forward heavy weights; we nevertheless daily see numbers of first rate draught horses with deep, flat shoulders. It used to be held, that a low shoulder facilitated draught; and such was the form of the old English Suffolk *sorrel* cart horses, the truest and most forceful pullers ever yet known; they were the only breed, collectively, that would draw *dead pulls*, that is to say, would continue repeated pulls, going down upon their knees at an immoveable object, for example, a tree. This, draught horses in general, even the most powerful and best, cannot be brought to do, with whatever severity; at the second or third pull, gibbing, as it is called, and turning their heads, as if to point with their eyes towards their failing loins. Such was the rage in former days, among the Suffolk farmers' men, for wagering on this sport of dead pulls, that many valuable teams of horses were annually strained and ruined in this manner.

To speak of the colors of these animals to the uninitiated, who are ambitious of describing things by their proper technical stable names, here follow the horseman's and sportsman's phraseology in the case, in which, by the by, wonderful to tell, we have yet no novelty or addition. The colors of horses are thus expressed—*black, white; gray, dappled gray,*

iron gray, flea-bitten gray; red, nutmeg and blue roan; strawberry; bald, face whited; ***pyebald***, spotted; ***dun; chestnut***, light and dark; ***brown***, light and dark; ***bay***, light bright or yellow. *Sorrel* is an obsolete Suffolk term for deep chestnut.

The age of the horse is discoverable on a general view, by the freshness or deadness of his hair, and its intermixture with gray, and by the hollowness and sinking in the orbits of his eyes; with precision, by the ***marks*** in his mouth which continue to rising, namely, coming eight years of age; beyond which period nothing relative can be determined but on conjecture. The length of his teeth, their edges standing more outward, by which aged horses are apt to bite and wound their lips in mastication; or if short, their foulness and dingy color, are signs of old age in apparent degrees. Nature has allowed the horse forty teeth, twenty-four ***grinders***, double teeth, twelve ***fore teeth***, and four ***tushes***, which last standing in the corners of the mouth, are peculiar to the horse, being seldom found with the mare; or if found, scarcely to be distinguished by the finger. The front teeth or ***gatherers*** are flat and smooth; the back jaw teeth or ***grinders***, twelve above, and twelve below, are strong, double, and with sharp edges, until smoothed by old age and use. The ***tushes*** are detached from the back teeth; the first, or ***foal's*** teeth, are tangible in a few months, ***twelve*** in number, above and below; they are remarkably white and small, not unlike the human fore teeth; and when mixed in the colt's mouth with those which succeed, the size renders then plainly distinguishable. In some, the foal's teeth remain several months after the appearance of the adult or horse's teeth. Generally the four middlemost foal's teeth, two above and two below, are cast at between two and three years of age, and their successors being complete, the colt or filly is deemed three years of age. At three years and a half, four additional foal teeth are cast on each side the ***nippers***, ***gatherers***, or middle teeth. The two middle teeth, above and below, full grown, indicate the age of ***four*** years; the tushes appearing nearly at the same time, occasionally rather earlier or later, they are then small, curved, and their summits encircled by a sharp edge, which becomes blunted in age; the inside of the tusk is somewhat grooved, hollow and rather flat. The horse-dealing fraud of extracting the foal's teeth, in order to cause a premature appearance of the adult, and to pass the horse for a four year old, may be detected by the absence of the tushes, which should appear at that period.

On the approach to, and at the age of *five* years, when the horse has nearly attained the prime of life, his corner teeth begin to appear; at first level with the gums and filled with flesh in their centre; the tushes also, increased in size, though not yet large, are somewhat rough and sharp. The corner teeth are remarkable, as more fleshy within than the middle, or front teeth, which reach their full growth in two or three weeks; whereas the corner teeth grow more leisurely, and are different from the fore ones, in that they resemble a shell, thence, by horsemen, they are styled at that period, *shelly*, the shell or mark teeth. In the process of growth, the shell, with these teeth, gradually disappears, leaving a vacuum. At *six* years old, this vacuum or hollowness begins to fill up, and the first fleshy substance becomes a brownish or dark spot, the *mark* resembling the eye of a bean, continuing in that state until the *seventh* year, but gradually filling up, and the mark becoming lighter in color. The mark being filled up, the horse's mouth is said to be *full*. He is styled *aged*. At *eight* years old, the mark, in general, is entirely obliterated. Some few, particularly certain foreign horses, form an exception, and carry the mark in their mouths until their *tenth* year. The gross and fraudful cruelty of imposing upon a colt the appearance of age, by extracting the foal's teeth, as above shown, ought, on detection, to ruin the character of the miscreant dealer; also that of forging the semblance of youth in the aged, which is performed by hollowing the teeth with a graver, and burning a counterfeit mark with a small iron. Long teeth are also filed down to hide age; by which the wretched animal becomes unable to chew his food. Alas! no additional period of labor is required to fill to the brim their cup of horror and misery.

Not arguments, reminiscence only can be wanted on the necessity of exercise for the stabled horse; more especially the high-fed, in order to remove bodily obstructions, promote the secretions, and give a healthful circulation of the fluids. Air and exercise regard two very material objects, preservation of the horse's health, and putting him into a condition, enabling him in due time to undergo with vigor, and in a creditable style, such exertions as may be required of him. The species intended in this place are saddle and coach horses; or indeed any, with the exception of the sporting kind, racers and hunters, which demand a more material and extensive consideration. For those horses, of whatever description, which are engaged in constant labor abroad, beyond all doubt that exercise is most salubrious and

preservative which they can give to themselves upon a comfortable and well-littered bed, not being made a fixture to the manger, but having full liberty to change their position, to turn, lie down, and roll, seeking the best posture in which to assuage their aches and pains, to stretch their contracted, and to ease and support their loosened sinews.

To keep the horse in *condition*, (there is much pith and meaning in that word,) he should be taken out twice, or once a day, according to season and the state of the weather. These airings should be daily and regular, omitted only in those excesses of foul weather, the exposure to which can be beneficial neither to man nor beast. The tolerance, however, must not go the length of excusing a groom who is afraid of ruffling his horse's coat, or soiling his legs, from the dread of a little additional trouble. The covered rides in great stables, and those in livery stables, afford an important convenience during bad weather. The exercises of horses in constant work should never be of the speedy or rattling kind; their labor is, in general, sufficient to wear out their legs and feet full soon enough. Walking exercise alone will keep a horse in good condition; beyond this, the slow trot, the moderate journey trot, and the canter, should not be exceeded. The nag may be accustomed and trained to that pace which is preferred and most used by the master; and a skilful groom may act the part of a riding master, and improve a horse greatly in his mouth, paces and habits. Many horses, good in nature and really valuable, may have been rudely and imperfectly broken. Such are apt to mix and run their paces one into another, shuffling between walk and trot, and between trot and canter. It is the business of a good groom during exercise, to correct these errors of progression, and to accustom the horse to change freely and easily from one pace to the other. The vice of *shying* and starting, also, may be, to a considerable degree, remedied in exercise. Should a man have two or three horses to look after, by consequence he would not have much time to spare; but in any case, an hour is sufficient for the airing, the chief part of which should be employed in the slow paces. Whether in morning, noon, or a summer afternoon, high-fed horses should be taken out with empty stomachs.

THE NIGHT HAWK.

GRAND DIVISION—*Vertebralia*, possessing a vertebral column or spine. CLASS—*Aves*, comprising birds. ORDER—*Passeres*, comprising birds of the sparrow-like family. GENUS—*Caprimulgus*, comprising those birds accused by the ancients, and many of the older writers, of sucking the teats of goats. SPECIES—*Americanus*, belonging to America.

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THIS bird in Virginia and some of the other southern states is called a ***bat***. The name ***night hawk*** is usually given in the middle and northern states, probably on account of its appearance, when on wing, very much resembling some of our small hawks, and from its habit of flying chiefly in the evening. Though it is a bird universally known in the United States, and inhabits North America, in summer, from Florida to Hudson's Bay, yet its history has been involved in considerable obscurity by foreign writers, as well as some of our own country. Of this we shall endeavor to divest it in the present account.

Three species only of this genus are found within the United States:—the ***chuck-will's-widow***, the ***whip-poor-will*** and the ***night hawk***. The first of these is confined to those states lying south of Maryland; the other two are found generally over the Union, but are frequently confounded one with the other, and by some supposed to be the same bird. A comparison of this with the figure of the whip-poor-will will satisfy those who still have their doubts on this subject; and the great difference of manners which distinguishes each will render this still more striking and satisfactory.

'On the last week in April,' says Wilson, 'night hawks commonly make their first appearance in the eastern part of Pennsylvania. They soon after disperse generally over the country, from the sea shore to the mountains, even to the heights of the Alleghany; and are seen, towards evening, in pairs, playing about, high in air, pursuing their prey—wasps, flies, beetles, and many other winged insects of the larger sort. About the middle of May the female begins to lay. No previous preparation or construction of nest is made, though doubtless the particular spot has been reconnoitred and determined on. This is sometimes in an open space in the woods, frequently in a ploughed field, or in the corner of a corn field. The eggs are placed on the bare ground, in all cases on a dry situation, where the color of the leaves, ground,

stones, or other circumjacent parts of the surface may resemble the general tint of the eggs, and thereby render them less easy to be discovered. The eggs are most commonly two, rather oblong, equally thick at both ends, of a dirty bluish white, and marked with innumerable touches of dark olive brown. To the immediate neighborhood of this spot the male and female confine themselves, roosting on the high trees adjoining during a greater part of the day, seldom, however, together, and almost always on separate trees. They also sit lengthwise on the branch, fence or limb on which they roost, and never across, like most other birds. This seems occasioned by the shortness and slender form of their legs and feet, which are not at all calculated to grasp the branch with sufficient firmness to balance their bodies.

'As soon as incubation commences, the male keeps a most vigilant watch around. He is then more frequently seen playing about in the air over the place, even during the day, mounting by several quick vibrations of the wings, then a few slower, uttering all the while a sharp, harsh squeak, till, having gained the highest point, he suddenly precipitates himself, head foremost, and with great rapidity, down sixty or eighty feet, wheeling up again suddenly, (see Fig.) at which instant is heard a loud booming sound, very much resembling that produced by blowing strongly into the bung-hole of an empty hogshead, and which is doubtless produced by the sudden expansion of his capacious mouth, while he passes through the air. He again mounts by alternate quick and moderate motions of the wings, playing about as he ascends, uttering his usual hoarse squeak, till, in a few minutes, he again dives with the same impetuosity and violent sound as before. Some are of opinion that this is done to intimidate man or beast from approaching his nest; and he is particularly observed to repeat these divings most frequently around those who come near the spot, sweeping down past them, sometimes so near and so suddenly as to startle and alarm them. The same individual is, however, often seen performing these manœuvres over the river, the hill, the meadow and the marsh, in the space of a quarter of an hour, and also towards the fall, when he has no nest. This singularity belongs peculiarly to the male. The female has, indeed, the common hoarse note, and much the same mode of flight, but never precipitates herself in the manner of the male. During the time she is sitting, she will suffer you to approach within a foot or two before she attempts to stir, and when she does, it is in such a fluttering, tumbling manner, and with such appearance of a lame

and wounded bird, as nine times in ten to deceive the person and induce him to pursue her. This "pious fraud," as the poet Thompson calls it, is kept up until the person is sufficiently removed from the nest, when she immediately mounts and disappears. When the young are first hatched, it is difficult to distinguish them from the surface of the ground, their down being of a pale, brownish color, and they are altogether destitute of the common shape of birds, sitting so fixed and so squat as to be easily mistaken for a slight prominent mouldiness lying on the ground. I cannot say whether they have two broods in the same season; I rather conjecture they have generally but one.

'The night hawk is a bird of strong and vigorous flight, and of large volume of wing. It often visits the city, darting and squeaking over the streets at a great height, diving perpendicularly with the same hollow sound as before described. I have also seen them sitting on chimney tops in the most busy parts of the city, occasionally uttering their common note.

'When the weather happens to be wet and gloomy, the night hawks are seen abroad at all times of the day, generally at a considerable height. Their favorite time, however, is from two hours before sunset until dusk; at which time they seem all vivacity, darting about in the air in all directions, making frequent short, sudden turnings, as if busily engaged in catching insects. Even in the hottest clear weather they are occasionally seen abroad, squeaking at short intervals. They are often found sitting along the fences, basking themselves in the sun. Near the sea shore, in the vicinity of extensive salt marshes, they are likewise very numerous, skimming over the meadows in the manner of swallows, until it is so dark that the eye can no longer follow them.

'When wounded and taken, they attempt to intimidate you by opening their mouth to its utmost stretch, throwing the head forward, and uttering a kind of guttural whizzing sound, striking also violently with their wings, which seem to be their only offensive weapons; for they never attempt to strike with the bill or claws.

'About the middle of August they begin to move off south; at which season they may be seen almost every evening, from five o'clock until after sunset, passing along the Schuylkill and the adjacent shores, in widely scattered multitudes, all steering towards the south. I have counted several hundreds within sight at the same time, dispersed through the air, and darting after insects as they advanced. These occasional

processions continue for two or three weeks; none are seen travelling in the opposite direction. Sometimes they are accompanied by at least twice as many barn swallows, some chimney swallows and purple martins. They are also most numerous immediately preceding a northeast storm. At this time also they abound in the extensive meadows on the Schuylkill and Delaware, where I have counted fifteen skimming over a single field in an evening. On shooting some of them on the 14th of August, their stomachs were almost exclusively filled with crickets. From one of them I took nearly a common snuff box full of these insects, all seemingly freshly swallowed.

'By the middle or 20th of September, very few of these birds are to be seen in Pennsylvania. How far south they go, or at what particular time they pass the southern boundaries of the United States I am unable to say. None of them winter in Georgia.

'The ridiculous name *goat sucker*, which was first bestowed on the European species, from a foolish notion that it sucked the teats of the goats, because, probably, it inhabited the solitary heights where they fed, which nickname has been since applied to the whole genus, I have thought proper to omit. There is something worse than absurd in continuing to brand a whole family of birds with a knavish name, after they are universally known to be innocent of the charge. It is not only unjust, but tends to encourage the belief in an idle fable that is totally destitute of all foundation.'

The night hawk is nine inches and a half in length, and twenty-three inches in extent; the upper parts are of a very deep blackish brown, unmixed on the primaries, but thickly sprinkled or powdered on the back scapulars and head with innumerable minute spots, and sprinkled with light clay. A spot of pure white extends over the first five primaries, the outer edge of the exterior feather excepted, and about the middle of the wing; a triangular spot of white also marks the throat, bending up on each side of the neck; the bill is exceedingly small, scarcely one-eighth of an inch in length, and of a black color; the nostrils circular, and surrounded with a prominent rim; eye large and full, of a deep bluish black; the legs are short, feathered a little below the knees, and as well as the toes, of a purplish flesh color, scarred with white; the middle claw is pectinated on its inner edge, to serve as a comb to clear the bird of vermin; the whole lower parts of the body are marked with dusky and yellowish transverse lines. The tail is somewhat shorter than the wings when shut, is hand-

somely forked, and consists of ten broad feathers; the mouth is extremely large, and of a reddish flesh color within; there are no bristles about the bill; the tongue is very small and attached to the inner surface of the mouth.

The female measures about nine inches in length, and twenty-two in breadth; differs from the male in having no white band on the tail, but has the spot of white on the wing; wants the triangular spot of white on the throat, instead of which there is a dully defined mark of a reddish cream color; the wings are nearly black, all the quills being slightly tipped with white; all the scapulars, and the whole upper parts are powdered with a much lighter gray.

THE WHIP-POOR-WILL—*Caprimulgus vociferus.*

THIS is a singular and very celebrated bird, universally known over the greater part of the United States for the loud reiterations of his favorite call in spring; and yet personally he is but little known, most people being unable to distinguish this from the preceding species, when both are placed before them; and some insisting that they are the same. This being the case, it becomes the duty of his historian to give a full and faithful delineation of his character and peculiarity of manners, that his existence as a distinct and independent species may no longer be doubted, nor his story mingled confusedly with that of another. We trust that those best acquainted with him will bear witness to the fidelity of the portrait.

'On or about the 25th of April,' says Wilson, 'if the season be not uncommonly cold, the whip-poor-will is first heard in the eastern part of Pennsylvania in the evening, as the dusk of twilight commences, or in the morning as soon as dawn has broke. In the state of Kentucky I first heard this bird on the 14th of April, near the town of Danville. The notes of the solitary bird, from the ideas which are naturally associated with them, seem like the voice of an old friend, and are listened to by almost all with great interest. At first they issue from some retired part of the woods, glen or mountain; in a few evenings, perhaps, we hear them from the adjoining coppice, the garden fence, the road before the door, and even from the roof of the dwelling house, long after the family have retired to rest. Some of the more ignorant and superstitious considered this near approach as foreboding no good to

the family—nothing less than sickness, misfortune or death to some of its members. These visits, however, so often occur without any bad consequences, that this superstitious dread seems on the decline.

'He is now a regular acquaintance. Every morning and evening his shrill and rapid repetitions are heard from the adjoining woods, and when two or more are calling out at the same time, as is often the case in the pairing season, and at no great distance from each other, the noise mingling with the echoes from the mountains, is really surprising. Strangers, in parts of the country where these birds are numerous, find it almost impossible, for some time, to sleep; while to those long acquainted with them the sound often serves as a lullaby to assist their repose.

'These notes seem pretty plainly to articulate the words which have been generally applied to them—*whip-poor-will*—the first and last syllables being uttered with great emphasis, and the whole repeated in about a second; but when two or more males meet, their whip-poor-will altercations become much more rapid and incessant, as if each were straining to overpower or silence the other. When near, you often hear an introductory cluck between the notes at these times, as well as at almost all others. They fly low, not more than a few feet from the surface, skimming about the house and before the door, alighting on the wood pile, or settling on the roof. Towards midnight they generally become silent, unless in clear moonlight, when they are heard with little intermission till morning. If there be a creek near, with high precipitous bushy banks, they are sure to be found in such situations. During the day they sit in the most retired, solitary and deep-shaded parts of woods, generally on high ground, where they repose in silence. When disturbed, they rise within a few feet, sail low and slowly through the woods for thirty or forty yards, and generally settle on a low branch or on the ground. Their sight appears deficient during the day, as, like owls, they seem then to want that vivacity for which they are distinguished in the morning and evening twilight. They are rarely shot at or molested; and from being thus transiently seen in the obscurity of dusk, or in the deep umbrage of the woods, no wonder their particular markings of plumage should be so little known, or that they should be so confounded with the night hawk, whose appearance, in general, they so much resemble. The female begins to lay about the second week in May, selecting for this purpose the most

unfrequented part of the woods, often where some brush, old logs, heaps of leaves, &c. had been lying, and always on a dry situation. The eggs are deposited on the ground, or on the leaves; not the slightest appearance of a nest visible. These are usually two in number, in shape much resembling those of the night hawk, but having the ground color much darker, and more thickly marbled with dark olive. The precise period of incubation I am unable to say.

'Early in June, as soon as the young appear, the notes of the male cease, or are heard but rarely. Towards the latter part of summer, a short time before these birds leave us, they are again occasionally heard; but their call is then not so loud, much less emphatical and more interrupted than in spring. Early in September they move off towards the south.

'I shall not, in the manner of some, attempt to amuse the reader with a repetition of the unintelligible names given to this bird by the Indians, or the superstitious notions generally entertained of it by the same people. These seem as various as the tribes, or even families, with which you converse; scarcely two of them will tell you the same story. It is easy, however, to observe, that this, like the owl and other nocturnal birds, is held by them in a kind of suspicious awe, as a bird with which they wish as little to do as possible. The superstition of the Indian differs very little from that of an illiterate German, a Scots Highlander, or the less informed of any other nation. It suggests ten thousand fantastic notions to each, and these, instead of being recorded with all the punctilio of the most important truths, seem only fit to be forgotten. Whatever, among either of these people, is strange and not comprehended, is usually attributed to supernatural agency; and an unexpected sight, or uncommon incident is often ominous of good, but more generaliy of bad fortune to the parties. Night, to minds of this complexion, brings with it its kindred horrors, its apparitions, strange sounds and awful sights; and this solitary and inoffensive bird being a frequent wanderer in these hours of ghosts and hobgoblins, is considered by the Indians as being, by habit and repute, little better than one of them. All these people, however, are not so credulous. I have conversed with Indians who treated these silly notions with contempt.

'The whip-poor-will is never seen during the day, unless in circumstances such as have been described. Their food appears to be large moths, grasshoppers, pismires, and such

insects as frequent the bark of old, rotten and decaying timber. They are also expert in darting after winged insects. They will sometimes skim in the dusk within a few feet of a person, uttering a kind of low chatter as they pass. In their migrations north, and on their return, they probably stop a day or two at some of their former stages, and do not advance in one continued flight.

The whip-poor-will is nine inches and a half long, and nineteen inches in extent. The bill is blackish, a full quarter of an inch long, much stronger than that of the night hawk, and bent a little at the point, the middle arched a little upwards, following the curvature of the upper; the nostrils are prominent and tubular, their openings directed forward; their mouth is extravagantly large, of a pale flesh color within, and beset along the sides with a number of long, thick, elastic bristles, the longest of which extend more than half an inch beyond the point of their bill, end in fine hair, and curve inwards; these seem to serve as feelers, and prevent the escape of winged insects; the eyes are very large, full, and bluish black; the plumage above is variegated with black, pale cream, brown or rust color, sprinkled and powdered in such minute streaks and spots as to defy description; the upper part of the head is of a light brownish gray, marked with a longitudinal streak of black, with others radiating from it; the back is darker, finely streaked with a less deep black; the scapulars are very light whitish ochre, beautifully variegated with two or three oblique streaks of very deep black; the tail is rounded, consisting of ten feathers, the exterior one an inch and a quarter shorter than the middle ones, the three outer feathers on each side are blackish brown for half their length, thence pure white to the tips, the exterior one is edged with deep brown nearly to the tip; the deep brown of these feathers is regularly studded with light brown spots, the four middle ones are without the white at the ends, but beautifully marked with herring-bone figures of black and white ochre, finely powdered; cheeks and sides of the head of a brown, orange or burnt color; the wings, when shut, reach scarcely to the middle of the tail, and are elegantly spotted with very light and dark brown, but are entirely without the large spot of white which distinguishes those of the night hawk; chin black, streaked with brown; a narrow semi-circle of white passes across the throat; breast and belly irregularly motley, and streaked with black and yellow ochre; the legs and feet are of a light bluish

flesh color, seamed with white, the former feathered before nearly to the feet; the two exterior toes are joined to the middle one, as far as the first joint, by a broad membrane; the inner edge of the middle claw is pectinated, and from the circumstance of its being frequently found with small portions of down adhering to the teeth, is probably employed as a comb to rid the plumage of its head of vermin, this being the principal and almost only part so infested in all birds.

The female is about an inch less in length and in extent; the bill, mustaches, nostrils, &c. as in the male. She differs in being much lighter on the upper parts, seeming as if powdered with grains of meal; and, instead of the white on the three lateral tail feathers, has them tipt for about three-fourths of an inch with a cream color; the bar across the throat is also of a brownish ochre; the cheeks and region of the eyes are of a bright brownish orange, which passes also to the neck, and is sprinkled with black and specks of white; the streak over the eye is also lighter.

Though this noted bird has been so frequently mentioned by name, and its manners taken notice of by almost every naturalist who has written on our birds, and as there has long been an opposition of sentiment, and many fruitless disputes whether the whip-poor-will and the night hawk are one and the same bird, we shall resume the subject in some future number, and add satisfactory proofs that they are two distinct species.

THE QUINCE.

NATURAL ORDER—*Rosaceae*, resembling the rose in flowers and medicinal properties, being refrigerant, tonic and astringent. CLASS—*Icosandria*, having about twenty stamens situated on the calyx. ORDER—*Pentagynia*, having five pistils. GENUS—*Cydonia*, comprising quinces. Calyx 5-cleft, superior: corol 5-petalled: pome 5-celled, many-seeded: seed compressed-ovate.

THE quince was called *Cydonia*, from Cydon, in Crete, an island in the Mediterranean, now called Candia. It is a fruit that the ancients held in high estimation. They considered it the emblem of happiness, of love and of fruitfulness. It was dedicated to Venus, and the temples of Cyprus and Paphos were decorated with it. The statues of the gods also,

who presided at the nuptial bed, were ornamented with this fruit; and the bride, before she entered into the marriage bed, used to eat of the quinces. Columella says, quinces not only yield pleasure, but health also. He speaks of three kinds:—the Struthian, the Must Quince, and the Orange or Golden Quince.

The learned Goropius maintains that quinces were the golden apples of the Hesperides, and not oranges, as some commentators pretend. In support of his argument, he states that it was a fruit much revered by the ancients; and he assures us that there has been discovered at Rome a statue of Hercules that held in its hand three quinces. This, he says, agrees with the fable which states, that Hercules stole the golden apples from the gardens of Hesperides.

Pliny speaks of quinces, and says 'there are many kinds of this fruit in Italy, some growing wild in hedge rows, others so large that they weigh the boughs down to the ground; some of a green hue, others inclining to a gold color.' These were called *chrysomela*, which seems to give authority to the above account of Goropius. The only kind that was eaten raw he states to have been raised by grafting the large quince upon the stock of a small kind called *struthla*. He adds—'All kinds of this fruit are in use now-a-days, within the waiting or presence chambers of our great personages, where men give attendance to salute them as they come forth every morning.' He also states that they were used to garnish the images which stand about the bed's head and sides.

The same author writes much on the medicinal qualities of this fruit. 'Quinces,' says he, 'when eaten raw, if quite ripe, are good for those that spit blood, or are troubled with hemorrhage.' The juice of raw quince he states to be a sovereign remedy for the swollen spleen, the dropsy, and difficulty of taking breath, particularly to those who cannot draw their breath but in an upright position. The flowers, either fresh or dried, he tells us, are good for the inflammation of the eyes. The root of the tree was used more as a charm than a medicine for those afflicted with the scrofula.

Quince trees grow wild on the banks of the Danube. In the south of France, particularly on the borders of the Garonne, it is very extensively grown; and the peasants prepare from it a marmalade which they call *cotignac*. The term marmalade is derived from the Portuguese name for the quince, *marmelo*.

The quince was introduced into England from the island of Crete in 1537.

There are seven distinct varieties enumerated in the ***Hortus Britannicus***, the names and descriptions of which are as follows:—

Specific Names.	*Time of Flow.*	*Color of Petals.*	*Native Place.*
Common, *Vulgaris*,	May, June,	White,	Austria.
Apple-formed, *Maliformis*,	do.	do.	do.
Lusitanian, *Lusitanica*,	do.	do.	Spain.
Oblong-fruited, *Oblonga*,	do.	do.	Europe.
Japan, *Japonica*,	Year,	Scarlet,	Japan.
White, *Alba*,	do.	Pink or rose,	do.
Chinese, *Sinensis*,	May, June,	White,	China.

All the species may be propagated by layers, and most of them will flourish in a common garden soil.

The quince has a peculiar smell, and an austere taste when raw, but when prepared it is much esteemed. They are used in medicine, being of an astringent and stomachic quality. The expressed juice of this fruit, in small quantities, as a spoonful or two, is of service in nausea, vomiting, &c. Lord Bacon says—'It is certain that the use of quinces is good to strengthen the stomach; but we take them to be better if they be used in that which they call *quiddeny* of quinces, than in the bodies of quinces themselves, because they lie heavy in the stomach; but those quiddenies are best taken after meals, alone—before meals, dipped in vinegar.'

An agreeable wine may be made with quinces, by cutting the large ones into quarters, and coring them, as the seeds give the wine an unpleasant flavor. Let them be ground in the same manner as apples for cider, and put to every gallon of pomace a gallon of water. Let it stand a day or two, then strain it off. Should the pomace smell very strong of the fruit, it will bear a little more water; and to every gallon put three pounds and a quarter of moist sugar. Tun it and stop quite close in the following March or April; rack it off; cleanse the cask from the sediment, and put it back again; and in the second year bottle it off. It will be greatly improved by long keeping, and is much esteemed by asthmetic persons. Quince marmalade is greatly admired by those who are fond of the fruit.

In pruning of the quince tree little is required, except to keep the stem free from suckers, and to cut all branches that rub each other.

THE CRANBERRY.

NATURAL ORDER—*Ericeae*, resembling the erica in flowers and medicinal properties, being tonic, astringent and refrigerant. CLASS—*Octandria*, having eight stamens situated on the calyx. ORDER—*Monogynia*, having but one pistil. GENUS—*Oxycoccus*, comprising cranberries. Calyx superior, 4-toothed: corol 4-parted, the divisions sub-linear, revolute: filaments converging; anthers tubular, 2-parted: berry many-seeded.

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THE cranberry, which is so much esteemed in tarts, is a native of the turfy, mossy bogs in the mountainous and fenny parts of Europe, New Holland and America, flowering from May to July. Few plants are more elegant. Its wiry, shrubby stems creep among the bog moss with long branching, fibrous roots, which often appear to imbibe nourishment from the clear water alone.

There are four species of cranberry enumerated in the *Hortus Britannicus*, the most important of which are the Long-fruited Cranberry, *Oxycoccus macrocarpus*, and the Red-fruited Cranberry, *Oxycoccus erythrocarpus*, both indigenous to the United States. They are the produce of damp swampy lands only; but the idea that they will not bear transplanting is erroneous, for they have been transplanted from this country to England, and produced fruit beyond calculation. Mr. H. Hall, of Barnstable, Mass. nas been engaged for twenty years or more in the cultivation of this fruit; and his grounds have averaged, for the last ten years, seventy bushels per acre, and some seasons he has had one hundred bushels. Mr. F. A. Hayden, of Lincoln, Mass. gathered from his farm last year four hundred bushels of cranberries, which he sold in this city for six hundred dollars. It is well known that cranberries are capable of being transported to Europe without suffering by the voyage. American cranberries are frequently sold in London at eight dollars a bushel, as fresh as when first gathered from the marshes. This information may be worth the attention of those who have marshy or brook land, as a matter of profit; and to those who have ornamental water in their gardens or parks, it would be found an embellishment to the banks, it being an elegant little fruit on the ground, where it trails and spangles the grass with red and variegated berries.

Cranberries are of an astringent quality, and esteemed good to restore the appetite. They were formerly imagined efficacious in preventing pestilential diseases.

Cranberries may be preserved perfect for several years, merely by drying them a little in the sun, and then stopping them closely in dry bottles. The red-fruited cranberry yields a juice which has been employed to stain paper or linen, purple. These berries are of great value and importance for different culinary well-known purposes, as in pies, tarts, &c.

Cranberries may all be raised from seeds, or off-set root-suckers, creeping roots, and trailing rooting stalks. Those also growing with several rooted stalks and branches, may be divided in the root and top into separate plants, in which way they succeed very well. The seeds should be sown, where that method is pursued, in autumn, as soon as they are ripe and gathered, in a shady border, or in the places where the plants are to grow and remain; and when the young plants are up they should be kept clean, and be removed, with earth about their roots, as there may be occasion. The off-sets and root-plants may be set out in the same season in a soil resembling that in which they naturally grow. It may likewise be advisable in many cases to take the plants from their natural situations with balls of earth about their roots. Some, however, succeed in the common borders and other parts. They may in some cases be removed in the spring season, but the other is the better way.

NATIVE AMERICAN SILK WORMS.

The following letter has been addressed, by Mr. Illanes, of Jalapa, to the Board of Directors of the National Industry at Mexico. It is dated Jan. 6, 1831.

'The quantity of wild silk produced by the immense forests of this state is truly astonishing. The worms which produce it feed on the leaves of the *guayabo*, an evergeen with small leaves, or on those of the oak; but the finest silk is that of the worms which feed on the former. These worms, in my opinion, are those which a Chinese author describes by the name of *Tusen-Kyeu* or *Tyau-Kyen*, which are raised in that country, and with this silk they make the stuffs which

they call *Kyeu-Chen*, which is a handsome drugget, and so much esteemed that sometimes it sells as high as the first tissues of China.

'The natives of this state gather that silk in the month of March. They take off the large bags with which the cocoons are covered, leaving them exposed to the air during four days, after separating from the tree the branches which contain them, in order to free them from imperceptible thorns, left there by the skin of the silk worms; and after cleaning them they spin the silk and make girdles therewith, which last fifteen or twenty years in daily use. The strength of these girdles is such, that one having been tied to the horns of a wild bull, resisted his efforts for more than twenty-four hours, which was thought a sufficient trial.

'They make here no other use of this beautiful silk, and no pains have been yet taken to bleach it, before or after it is manufactured. This silk is gathered in this state by the Mixteen Indians, who come down in the month above mentioned, and also cut off the honey combs from the wild bee hives, and collect in abundance the honey and wax which they produce. In the vicinity of this city the trees begin to be covered with that valuable silk, and in the districts of Dosamalsapan, Alvarado and Acoyncan, and in short, in all the finest forests in this state, in which are found the trees above mentioned, it is produced in great abundance.

'The worms have for their enemies certain birds of the size of a tame pigeon, of a gray color, and known by the name of *Pepe*, because their whistling imitates the sound of that word. they seat themselves on the branches where the bags are hanging, peck at and pierce them, and devour the useful little animals.

'These worms begin their work at nine o'clock at night. Then they come out of their bags and begin to feed. In their passage they draw long silk threads, which serve them as guides to return to their cocoons; thus they make to themselves silken roads or bridges, the threads of which are of an extraordinary strength.'

THE CHINESE MULBERRY.

Morus Multicaulis.

This newly introduced variety of mulberry for feeding silk worms is undoubtedly an important acquisition; and more particularly so to this country, where silk is on the eve of becoming a staple article of production, The editor of the American Farmer has had this variety under cultivation for two years, and has made himself acquainted with its peculiarities, both as to quality and the manner of cultivating it. Not having a sufficient quantity for a full trial of feeding silk worms with it, he has been obliged to confine his experiments to occasional feedings, at which times the worms promptly left the Italian white mulberry leaf and devoured the new Chinese with avidity. The leaves of the new mulberry frequently measure a foot in length and ten inches in width. Indeed Mrs. Parmentier, the lady of the late Andrew Parmentier of the Brooklyn nursery and garden, who has 1600 of the trees for sale, in a letter to the editor says, that some of the leaves on the trees in that establishment measure thirteen inches in length, and that the worms left six different kinds of mulberry to feed on them. Although the number of leaves on the tree is not so great as that of those on the white, we should judge that the weight of the leaf was much greater—it is so great, in fact, that during a rain or after a heavy dew, the young trees are bent almost to the ground by the weight of their foliage. This mulberry bears no fruit, or rather it is so minute and so small in quantity that the propagation of it from seed is never practised. But like all other vegetables of difficult propagation by seed, it is remarkably easy of reproduction by other means. By laying down the young trees, covering them with earth, and leaving the ends of the branches out, every branch will take root and become a young tree in two or three weeks; so that every tree one year old will by proper management produce from ten to twenty in one summer. We laid down a tree on Friday, July 29, 1831, and a part of the stock near the root containing no branches, was left out of ground On the Friday following two buds were seen shooting from the naked stock, and earth was then covered over the stock and around the buds. The young trees from these buds now measure three feet in height. This fact will serve to illustrate the great facility of propagating the

morus multicaulis by layers. As this mulberry does not grow high, the leaves can always be gathered by hand from the ground without the aid of ladders, or the danger attending the climbing of large trees. They can be planted pretty closely together, and we should judge that an acre of ground would produce more foliage with this than with the white mulberry. The ***morus multicaulis*** being as yet quite scarce in this country, they sell high; but every one who contemplates cultivating silk should obtain a few, and by laying them down in July, multiply them. By this means ten trees obtained this fall would, in five years, produce one million of trees, allowing each one to produce ten every year, which we are convinced they will certainly do; that is, in the fall of 1832 there would be 100; in 1833, 1000; in 1834, 10,000; in 1835, 100,000; in 1836, 1,000,000; and these, we have no hesitation in saying, would produce ten times as much foliage as could be produced with the same expense and labor, in the same time, of the white mulberry or any other kind. We hope editors in the country will give free circulation to these facts, that the cultivators of silk, and those who contemplate entering upon that business, may avail themselves of the advantages of this mulberry in commencing their orchards. It can be obtained of William Prince & Sons, at the Linnæan Botanic Garden at Flushing, N. Y. of Mrs. Parmentier, at the Horticultural Botanic Garden at Brooklyn, N. Y. of the editors of the American Farmer, and of the New England Farmer. They are generally sold at one dollar each.—*American Farmer.*

TIN.

CLASS—*Metallic*, comprising metals. GENUS—*Stannum*, comprising tin.

TIN has not yet been found on the continent of America, excepting a small quantity in Mexico and Chili. The most extensive mine is that of Cornwall, in England. It is found in small quantities (always in granite or gneiss) in Spain, France, Ireland, Sweden, Bohemia, Saxony and the East Indies. It is mostly in the state of an oxid.

The tin foil is pretty pure, and the grain tin considerably so. What is called ***block tin*** was chiefly tin half a century

ago. Now it is generally much alloyed with lead. Tin alloyed with lead forms *pewter*. It is most extensively used for covering the surface of thin sheets of iron, called *sheet tin*. When tin is thus applied in a pure state it forms very useful ware. But the high price of tin encourages manufacturers to alloy the tin with lead and thus injure the ware.

Tin must have been known very early, as it is mentioned by Homer, and also in the books of Moses. It is a white metal, of little elasticity. It is not very ductile, but so malleable that it may be beaten out into leaves thinner than paper. Tin foil is usually about one-thousandth part of an inch in thickness. It becomes fusible in a temperature of 442° F. above zero, and is 7.3 times heavier than water.

Tin is not oxidated at the common temperature.

Illustration. Wet a piece of tin foil and a case knife blade, and put them by under the cistern or elsewhere in a damp place. The next day the knife blade will be covered with rust, or oxid of iron and carbonate of iron, but the surface of the tin will not be affected by oxygen.

Application. On account of this property of tin, iron plates are covered with tin, forming the tin-plate ware. Lightning rods are tipped with tin to prevent the points from rusting. Copper vessels are tinned inside for the same reason.

Tin is oxidated when heated so as to be brought to the state of fusion.

Illustration. Put some tin in an iron ladle, and heat it no higher than merely to melt it. The surface will immediately absorb oxygen from the atmosphere sufficient to form the protoxid of tin, called the yellow oxid. This may be scraped off with an iron poker, when another similar pellicle will be formed; and the succession may be continued until the whole mass is a yellow oxid. If the protoxid of tin is put into a crucible, heated to redness, and continually stirred with an iron rod for some time, it will absorb another definite proportion of oxygen. It then becomes the peroxid of tin, called the white oxid or putty of tin.

Application. The white oxid of tin is an excellent powder for sharpening edge tools, as knives, razors, &c.; also for polishing burnishers' glass lenses, &c. When this oxid is melted with glass it forms the white enamel used for clock and watch faces, &c.

Tin combines with mercury at the common temperature; and at the time of its amalgamation with mercury will adhere to glass.

Illustration. Put a drop of mercury into a wine glass, and drop into it small pieces of tin foil, which will become liquified and unite with the mercury. Continue these additions until the amalgam contains about half as much tin as mercury. Next spread a small piece of tin foil very evenly on the face of a smoothing iron or a piece of polished marble. Pour the amalgam upon it, and rub it over the tin foil with the finger for about two minutes. Now press upon it a piece of dry, clean glass. Press it down with such force as to press out all the uncombined mercury. Lay a weight upon the glass and leave it half an hour; when it may be taken up, and will be found to be a mirror.

Application. All looking glasses are made in this way. In the large way a marble slab is placed in an inclined position, so that the excess of mercury runs off and is saved for the next, &c.

Tin will form an imperfect alloy with iron.

Illustration. Prepare a very thin slip of iron and scour it bright, dipping it several times, while scouring it, in very dilute sulphuric acid. Bend one end of it so that it will fit the inside of the bottom of a crucible. Melt some tin in the crucible, and dip the bent end of the slip of iron into it. The tin will combine with the surface of the iron, and, if it is very thin, it will penetrate entirely through it.

Application. On this principle the sheet tin is manufactured. We may often find sheets of tin, which, on cutting them across, appear to be alloyed entirely through with the tin, and may be soldered after a considerable portion is worn from the surface.

Tin will adhere to the surface of copper if perfectly cleaned and heated.

Illustration. Prepare a slip of copper by scraping it well with a knife and rubbing it over with sal ammoniac (muriate of ammonia.) Then heat the copper over clean coals, which do not emit smoke, at the same time rubbing it over with rosin. While hot, and thus cleaned with the sal ammoniac and rosin, rub tin upon it in the solid state, which, being melted by the heat of the copper will adhere to it, giving it a silvery white surface.

Application. By a similar process copper kettles and other copper vessels are tinned inside. When the tin is worn off any ingenious house keeper might repair it in this way.

Tin dissolved in nitro-muriatic acid (aqua regia) forms the muriate of tin; used for giving cochineal the scarlet color.

Illustration. Prepare the nitro-muriatic acid by mixing one part of muriatic acid with two of nitric acid, and put a very small quantity into a Florence flask. Drop tin into it by small quantities, that it may not become too hot by the rapid union of the tin and acid. After the acid is saturated, dissolve some of it in water.

Application. Dissolve in water in a wine glass a single cochineal insect of the shops, and drop in a little muriate of tin, and it will become of a bright scarlet. It may be made by dissolving the tin in strong muriatic acid, and then exposing it for some time to the atmosphere. When muriatic acid is used, the tin takes the lowest portion of oxygen. It is then the proto-muriate of tin. When the nitro-muriatic acid is used, the tin takes the highest portion of oxygen. It is then the per-muriate of tin. But if the proto-muriate of tin is exposed to the atmospheric air, the tin takes another portion of oxygen, becoming the peroxid; and the salt is of course the per-muriate of tin which is used by dyers.

ZINC.

Class—*Metallic*, comprising metals. Genus—*Zincum*, comprising zinc.

Zinc is mostly found in the state of a sulphuret, and accompanies lead in most mines. It is found in the Southampton lead mines in granite and gneiss. It is found in crystals of a waxy hue and almost transparent, in the geodiferous lime rock (or swine stone) every where from Genesee river to 20 or 30 miles west of Niagara Falls. It is one of the most abundant metals in nature except iron; and in Wales its ore was employed till lately in mending the roads. It is used in China for the current coin, and for that purpose is employed in the utmost purity. It is a very combustible metal, and when broken appears of a shining bluish white. It becomes fusible in a temperature of 700° F. above zero, and is 7 times heavier than water.

Zinc forms a white oxid, very light and flocculent on being melted and boiled in contact with atmospheric air.

Illustration. Put into a crucible one ounce of zinc. Raise the heat so as to melt it, then boil it a short time, and then raise the heat still higher and stir it with a rod. Flocculent flakes of the white oxid will begin to fly out of the crucible. Take the crucible out of the fire, and keep continually stirring it, and the room will be filled with the oxid, which is carried about by the air like fine down.

Application. This is the substance which was formerly called *white nothing*, (*nihil album*,) *philosopher's wool* and *pompholix*. In medicine it was called flowers of zinc. When intended for medical use it is collected from the sides of the crucible, put into water and stirred up a while, then suffered to settle. Afterwards the water is poured off, and the oxid is dried and put up for use. Fine filings of zinc may be oxidated and inflamed with explosion, by mixing it with oximuriate of potash and striking the mixture with a hammer on an anvil.

Zinc combines with sulphuric acid and forms sulphate of zinc, called white vitriol.

Illustration. Pour diluted sulphuric acid upon zinc, leaving the zinc in excess. After the action ceases, pour off the clear liquid, which is the white vitriol in solution. If this be evaporated slowly, crystals will be formed.

Application. By a similar process the white vitriol of the shops is manufactured.

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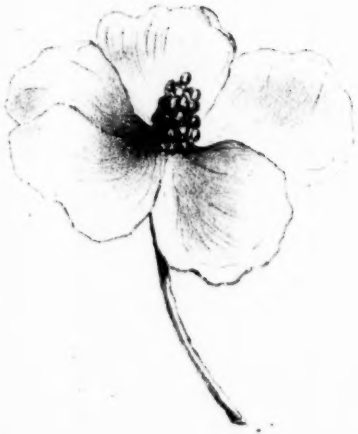
Fig. 1.

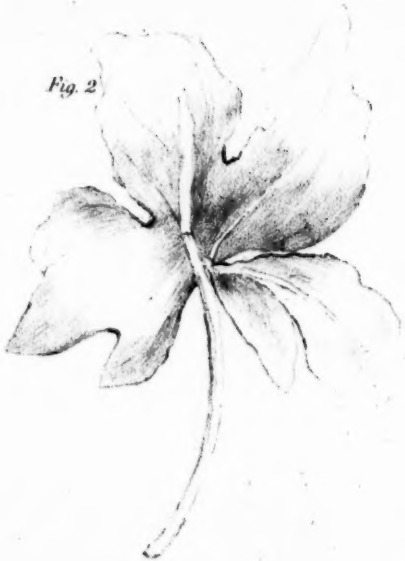
Fig. 2

Fig. 3

Fig. 4

Fig. 5.

Pendleton's Lithog.ª Boston.